REMARKS

Claims 1-3 and 6-13 are pending in the current application. Claims 1 and 10 are amended by this Amendment. No claims are added or canceled by this Amendment.

Examiner's Response to Applicant's Arguments

The Examiner in his response to Applicant's appears to interpret the amended claims to show that the optimum applied voltages are read from storage and then applied to only the source electrode to shift only the source electrode voltage and compensate for parasitic capacitance in the switching element of the pixel. Applicant respectfully submits that the Examiner is misinterpreting claim 1.

For example, Applicant notes the specification at page 14, lines 7-10 discloses "a voltage waveform to be shifted, which is not limited to the voltage waveform for the source electrode voltage, may be a voltage waveform for the common electrode voltage." Accordingly, Applicant's specification does not limit shifting of a voltage wave form to the source electrode voltage.

Applicant recognizes that claim 1 recites *inter alia* "each pixel has a switching element for switching ON and OFF application to the pixel of the source electrode voltage, in which a value of the source electrode voltage is set to a value which compensates a variation of the source electrode voltage due to parasitic capacitance of the switching element when the switching element is OFF."

However, Applicant respectfully submits that the Examiner is misinterpreting the above noted features of claim 1. For example, an offset (e.g., an optimum applied voltage) may be applied to either a source electrode or the common electrode to further compensate for a situation when "a value of the source electrode voltage is set to a value which compensates a variation of

the source electrode voltage due to parasitic capacitance of the switching element when the switching element is OFF" as disclosed by claim 1 does not cause the value of the source electrode voltage to completely coincide with the value of the common electrode voltage.

For example, because of parasitic capacitance, a part of the source electrode voltage, for example, the voltage of the convex part of the wave form may vary. In order to correct the voltage applied to the pixels, an additional voltage may be applied only to this part. However, as a result, the center level of the source electrode voltage becomes misaligned from the center level of the common electrode voltage. It is at this point, in order to cancel the misalignment, either the source electrode voltage or the common electrode voltage may be shifted as a whole.

Therefore, in example embodiments an alternate signal voltage may be set to the original value plus the DC voltage to compensate for a difference in voltage created by a parasitic capacitance. Accordingly, in example embodiments an offset (e.g., an optimum applied voltage) may be additionally added to the alternate signal voltage so that the alternate signal voltage may be totally shifted and a flicker may be reduced. This offset voltage may be applied to either the source electrode or the common electrode.

Accordingly, Applicant respectfully requests the Examiner consider the below arguments in view of the above interpretation of claim 1.

Noguchi and Koyama

In view of Applicant's remarks above, Applicant respectfully requests the Examiner reconsider the pending claims in light of the reference Noguchi et al. (U.S. Pat. No. 7,084,849, herein Noguchi) and Koyama (U.S. Pat. No. 6,600,465, herein Koyama) cited in the previous Office Action.

Noguchi discloses a dual mode liquid crystal display device 500 having a reflecting mode and a transparent mode.[1] Noguchi discloses that there is a Difference between the potential difference "B" of the potential of the electrode in the reflecting region 524 and the potential difference "A" of the potential of the electrode in the transparent region 522.[2] In order to compensate for the Difference, the voltage which is applied to the electrode 512 in the reflecting region 524 in the reflecting mode and the voltage which is applied to the electrode 512 in the transparent region 522 in the transparent mode are set to values which are different from each other.[3] In particular, the alternating voltage applied to the electrode 512 in the reflecting region 524 in the reflecting mode is set to the alternating voltage applied to the electrode 512 in the transparent mode 524 plus a DC voltage.[4] However, at the electrode 512 in the reflecting region 524 in the reflecting mode, the center level of the alternating voltage and the center level of the common electrode voltage do not coincide, and therefore, a flicker may still be observed.[5] In order to prevent the flicker in Noguchi, an offset is added to the alternating voltage for the electrode 512 in the reflecting region 524 so that its voltage is shifted totally and that the center level coincides with the center level of the common electrode voltage.[6]

Applicant respectfully submits that claim 1 differs from Noguchi in that the reasons the center levels do not coincide in claim 1 are different than the above noted reasons the center levels do not coincide in Noguchi. Applicant's claim 1 recites inter alia "each pixel has a switching element for switching ON and OFF application to the pixel of the source electrode voltage, in which a value of the source electrode voltage is set to a value which compensates a

[1] Noguchi at Col. 25-26, Ll. 14-27, FIGS. 14-15, and claim 15.
[2] Id.
[3] Id.
[4] Id.
[5] Id.
[6] Id.

variation of the source electrode voltage due to parasitic capacitance of the switching element when the switching element is OFF."

For example, there may be a parasitic capacitance between the gate and the drain in the switching element which switches on/off application of the voltage applied to the source electrode into the pixel. Because of the parasitic capacitance, if the switching element, e.g. the gate, turns off, the voltage applied to the source electrode may vary by the difference ΔV. In order to compensate for the difference ΔV, the value of the voltage applied to the source electrode is set to the original value plus the difference ΔV. However, the center level of the voltage applied to the source electrode and the center level of the common electrode voltage do not coincide. Therefore, a flicker may occur.

In order to prevent the flicker, an offset is added to the voltage applied to the source electrode so that the voltage applied to the source electrode is shifted totally and that its center level coincides with the center level of the common electrode voltage. For example, as noted above, an offset (e.g., an optimum applied voltage) may be applied to either a source electrode or the common electrode to further compensate for a situation when "a value of the source electrode voltage is set to a value which compensates a variation of the source electrode voltage due to parasitic capacitance of the switching element when the switching element is OFF" as disclosed by claim 1 does not cause the value of the source electrode voltage to completely coincide with the value of the common electrode voltage. Therefore, Applicant respectfully submits the reasons the center levels do not coincide are different between the reference Noguchi and the claim 1. Accordingly, Noguchi does not disclose at least "each pixel has a switching element for switching ON and OFF application to the pixel of the source electrode voltage, in which **a value of the source electrode voltage is set to a value which compensates a variation of the source electrode voltage due to parasitic capacitance of the switching element** when the switching

element is OFF" and "optimum applied voltages, each of which voltages is applied to an electrode having a shiftable voltage waveform, so as to match a center of a voltage waveform of the common electrode voltage with a center of a voltage waveform of the source electrode voltage in each of the display modes" as required by claim 1.

Regarding Koyama, even assuming arguendo that Koyama could be combined with Noguchi (which is not admitted), Koyama would still fail to make up for at least the previously mentioned deficiencies of claim 1 with respect to Noguchi. Accordingly, claim 1 is patentable over the alleged combination of references, even assuming arguendo that they could be combined.

Furthermore, Koyama discloses electric charge corresponding to the transmissivity recognized by the image sensor 105 is converted into digital form and held in the correcting value storage device 103.[7] The MPU 401 reads the corresponding value in the correcting value storage device 103[, and] [t]his read value is added to the digital image signal, thus creating a correcting digital image signal.[8] Therefore, in Koyama, the difference, between the value of the voltage which is to be applied to the pixel and the value of the voltage which has been really applied to the pixel, is stored. However, in claim 1 the value of the voltage whose center level has been adjusted is stored and the voltage is applied to the pixel. Therefore, Koyama does not disclose at least "storage means for storing values of optimum applied voltages" as required by claim 1.

Accordingly, Applicant respectfully submits claim 1 is patentable for at least the reasons discussed above. Further, Applicant respectfully submits claims 2-3 and 6-13, which depend from claim 1, are patentable for at least the same reasons as claim 1 as well as on their own merits.

Applicant further addresses the rejection regarding claim 2, noting that claim 2 is patentable for at least the reasons previously expressed regarding claim 1. Claim 2 recites *inter alia* "the storage means, which are connected to a common electrode drive circuit, are for storing a plurality of values of the optimum applied voltages for shifting a voltage waveform of a voltage applied to the common electrode, respectively for the display modes." Applicant respectfully submits that if the center levels of the source electrode voltage and of the common electrode voltage coincide in the reflecting mode by shifting the common electrode voltage waveform in Noguchi, the center levels of the source electrode voltage and of the common electrode voltage coincide in the transparent mode, which used to coincide, will fail to coincide, inversely. Therefore, Noguchi further fails to disclose "storing a plurality of values of the optimum applied voltages for shifting a voltage waveform of a voltage applied to the common electrode, respectively for the display modes" as required by claim 2.

Applicant also further addresses claims 12 and 13. In Koyama, the value of the voltage which has been really applied to the pixel is calculated by measuring the transmittance of the liquid crystal with the image sensor 105 installed in the display device.[9] The difference between the value of that voltage and the value of the other voltage applied externally is stored.[10] Therefore, Koyama further does not disclose "the storage means stores the values of the optimum applied voltages only once during manufacture of the display device" as required by claim 12.

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[7] Koyama at Col. 3, Ll. 41-44.
[8] Id. at Col. 3., Ll. 47-50.
[9] Id. at Col. 3, Ll. 39-40.
[10] Id. at Col. 3, Ll. 41-44.

Noguchi discloses only that the center of the source electrode voltage in the reflecting mode is shifted.[11] Therefore, Noguchi further does not disclose "the optimum applied voltages are different from each other with respect to each display mode" as required by claim 13.

Accordingly, Applicant respectfully submits that claims 1-3 and 6-13 are patentable for at least the above reasons.

Claim Objections

Claims 3 and 10 are objected to because of informalities. Applicant respectfully traverses these objections.

Regarding claim 3, the Examiner asserts claim 3 merely restates much of the subject matter taught in claim 1. Applicant respectfully submits that claim 3, if considered in light of the above explanation of claim 1, clearly further defines claim 1.

Regarding claim 10, the Examiner asserts that the thin film transistor is a more detailed description of the "switching element" recited in claim 1. Therefore, the Examiner recommends amending claim 10. Applicant respectfully submits that claim 10 is amended as suggested by the Examiner.

In view of the above, Applicant respectfully requests the objections to the claims be withdrawn.

Claim Rejections under 35 U.S.C. § 112

Claims 1-3 and 6-13 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant respectfully traverses this rejection.

[11] Noguchi at Col. 25-26, Ll. 14-27, FIGS. 14-15, and claim 15.

Regarding claim 1, the Examiner asserts the phrase "each of which voltages is/may be applied to an electrode having a shiftable voltage waveform" fails to make the claim distinct. Applicant respectfully submits that claim 1 is amended to replace "is/may be" with "is" to make the claim distinct.

Regarding claim 2, the Examiner asserts claim 2 teaches in opposition to the invention of claim 1. Applicant respectfully submits that claim 2, if considered in light of the above explanation of claim 1, clearly does not teach in opposition to claim 1.

In view of the above, Applicant respectfully requests the rejections to the claims under 35 U.S.C. § 112, second paragraph, be withdrawn.

Entry of Amendment

Applicant respectfully submits that the above amendments to the claims are made only to address claim objections in the interests of forwarding prosecution and reducing issues for appeal. Accordingly, Applicant respectfully requests entry of the present Amendment after Final.

CONCLUSION

Accordingly, in view of the above amendments and remarks, reconsideration of the objections and rejections and allowance of each of the claims in connection with the present application is earnestly solicited.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Donald J. Daley at the telephone number of the undersigned below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

HARNESS, DICKEY, & PIERCE, P.L.C.

By #35094

Donald J. Daley, Reg. No. 34,313

P.O. Box 8910
Reston, Virginia 20195
(703) 668-8000

DJD/AAM: tlt